

REMARKS

Reconsideration of the above-identified patent application in view of the remarks following is respectfully requested.

Claims 1-26 are pending in the application. Of the above, claims 13-21 were withdrawn from consideration, claims 1-12 have been allowed and claims 22-26 have been rejected. Applicant gratefully notes the allowance of claims 1-12. The Examiner's rejection of claims 22-26 is respectfully traversed.

§ 102 Rejections

Claims 1-3, 6-7, 10, 13 and 23-25 have been rejected under 35 U.S.C 102(b) as being anticipated by Wolf et al (US 5,526,453) (Wolf). The Examiner's rejection is respectfully traversed.

The present invention discloses a 3dB adiabatic coupler having two asymmetric (width wise) waveguides or branches **28** and **30**, each branch having curved sections with a variable curvature (paragraph 0028 of the published application). The two asymmetric waveguides are coupled to two input ports P₁ and P₂ through two bends **16** and **18** (ibid). The bends are separate elements, not included in the definition of "waveguides".

Wolf teaches a 3dB coupler comprising a pair of asymmetrical waveguides (21, 22). However, in contrast with the Examiner's assertion, these asymmetrical waveguides do not have a curved section with variable curvature, as recited in claim 22 of the present invention. Apparently, the Examiner has mistakenly identified Wolf's curved sections after regions T1 and T2 as part of the "asymmetric waveguides" recited in claim 1. However, these sections in Wolf are clearly identifiable with bends **16** and **18** of the present invention, which are elements separate from the waveguides, and not with waveguides **28, 30**. Therefore, Applicant respectfully submits that claim 1 is not anticipated by Wolf. Moreover, claim 1 is not even rendered obvious by Wolf, for reasons presented below.

It is exactly the incorporation of curved sections with varying radii that exist in the present invention and do not exist in Wolf that produces clear advantages of the adiabatic coupler disclosed herein over Wolf's coupler. This aspect is clearly stated in, among other places, paragraph 0012 of the disclosure:

"[0012] The invention makes a unique use of two input waveguide branches of different widths, each having a significant curved section in which the curvature changes, preferably continuously. That is, each such branch has a "variable curvature" section composed of preferably continuous sub-sections with different local radii. The local radii may vary from a very small radius (tending to zero) to a very large radius (tending to infinity). The small radii sub-sections of the two branches allow us to swiftly bring the input waveguides (which, at their input interface or "proximal end" are far enough to be optically uncoupled) closer to each other, thus reducing significantly the device dimensions. The radii of the curved sections increase smoothly as the gap between the branches decreases, until the curved sections turn into straight waveguide sections near a point where the branches intersect. This geometry preserves the adiabatic characteristics.

In other words, having a variable curvature as the waveguides progress toward an intersection area allows them to have a large angle therebetween when the interaction between waveguides is small and a smaller angle therebetween as they become closer and the interaction increases. This unique design difference vs. Wolf and all other prior art allows to reduce the coupler size significantly, typically to less than 1mm instead of the previous 4.3mm for the same region, while maintaining the adiabatic requirements.

In practice, the layout space consideration often results in limitations for the length of the coupler. The design of a coupler with such limitations according to Wolf's teachings will result in lesser optical performance relative to that of the coupler disclosed herein. In other words, a switch based on Wolf's design will not be wavelength independent.

In view of the remarks above, it is respectfully submitted that claims 22-26 are now in condition for allowance in addition to allowed claims 1-12. Prompt notice of allowance is respectfully and earnestly solicited.

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Respectfully submitted,



Mark M. Friedman

Attorney for Applicant

Registration No. 33,883

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